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10/559,528	12/02/2005	Claudia Maria de Lacerda Alvarenga Baptista	Q81622	2715

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EXAMINER	
NGUYEN, HUY TRAM	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/559,528	BAPTISTA ET AL.	
	Examiner	Art Unit	
	Huy-Tram Nguyen	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *34 and 35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33 and 36* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *December 2, 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 34 and 35 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claims 31, 32 and 33. See MPEP § 608.01(n). Accordingly, the claims 34 and 35 have not been further treated on the merits:

Claim 1-36 are objected to because of the following informalities:

Regarding Claim 28, it recites that "A process according to claim 1, wherein the flow of the reactive catalyst to oil mixture is downwards". Examiner cannot find support for it in specification.

Regarding Claim 1, except step of "obtaining mainly light products such as LPG, all steps are writing in form of apparatus "said mixed feeds comprising feeds A and B", "said process comprises the segregated injection of said feeds A and B in distinct riser locations" etc. These steps need to be re-written in form of process/method steps such as "providing said mixed feeds of feeds A and B" and "injecting said feeds A and B in distinct riser locations".

Claims 2-36 are dependent claims of Claim 1. Also, these claims need to be re-written in form of process/method steps.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gross et al. (US Patent No. 4,218,306) alone or alternatively in view of Zhang et al. (US Patent No. 6,416,656 B1).**

Regarding Claim 1, Gross et al. reference discloses a process for the fluid catalytic cracking of mixed feedstocks of hydrocarbon feeds from different sources, in a riser reactor **(Abstract)** and in the presence of a zeolitic catalyst under cracking conditions **(Column 1, Lines 64-67)**, for obtaining mainly light products such as LPG,

said mixed feeds comprising feeds A and B, with feed B being more refractory to cracking, wherein said process comprises the segregated injection of said feeds A and B in distinct riser locations **(Abstract)**, and wherein:

a) feed B is in an amount of from 5% and 50% by mass based on the total processed feed **(Table 2 – 49% by mass of secondary injection feed)**;

b) the injection location of feed A sets the base of the riser reactive section **(Abstract – fresh gas oil)**;

d) feed B is injected in one or more riser locations downstream the injection location of feed A **(Abstract – 10-30 feet above the riser bottom)** and shows, in combination:

i) higher coke selectivity relative to feed A **(Column 3, Lines 55-60 – higher code producing characteristics)**; and

ii) higher contaminant content **(Table 1 – Coker Heavy Gas oil and Chemical Reject),**

and where the injection conditions of feed B involve:

i) injection location between 10% and 80% of the total length of the riser reactive section (**Abstract and Figure I - 10 to 30 feet or 6 – 17 %)**;

ii) improved dispersion **(Column 2, Lines 59-62 – controlled coke deactivation of the catalyst)**; and

iii) injection temperature equal or higher to the injection temperature of feed A **(Table 2 - Riser Mix Temperature)**,

the LPG resulting from such cracking process being recovered in higher amount than that obtained if feeds A and B were injected both in the base of the riser reactive section **(Column 2, Lines 10-20 – optimize the yield of gasoline and/or distillate products).**

However, Gross et al. reference does not mention whether hydrogen is introducing into reactor. Zhang et al. reference discloses the similar process in the absence of hydrogen **(Column 1, Lines 8-9)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to not use hydrogen in the process for catalytic cracking of hydrocarbon oils as taught by Zhang et al., since Zhang et al. reference states at Column 1, Lines 7-12 that such modification would increase simultaneously the yields of diesel oil and liquefied gas.

Regarding Claim 2, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein feed A is a heavy distillation gasoil (HVGO) **(Gross et al. - Column 5, Lines 6-9 and Table 1 - Fresh feed & low aromatic index gas oil).**

Regarding Claim 3, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein feed B is produced by a thermal or by a physical separation process **(Gross et al. - Column 3, Lines 55-60 – product of thermal cracking)**.

Regarding Claim 4, where.the feed B being produced does not distinguish the process claim of the invention to the process of Gross et al. and Zhang et al. Regarding Claim 5, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the contaminants of feed B comprise total nitrogen and

polyaromatics **(Gross et al. - Table 1 – Coker Heavy Gas Oil and Chemical Reject).** However, Gross et al. reference does not disclose the nickel as metal contaminants. It would have been obvious to one having ordinary skill in the art at the time the invention was made to find nickel in the feed B components since it was known in the art use nickel as a catalyst in the previous hydroprocesses (such as hydrogeneration, desulphurization, hydrocracking). Also, Zhang et al. reference discloses a feed with nickel as a metal component of a conventional catalytic cracking feed **(Zhang et al. – Table 1).**

Regarding Claim 6, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the process conditions involve absence of overall sensible quenching effect resulting from feed B **(Gross et al. – Table 2 – riser mix temperature)**.

Regarding Claim 7, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein feed A is injected in a location of the base of the riser reactive section so as to have a longer contact time with the catalyst suspension, whereby the conversion into valuable products is increased **(Gross et al. - Column 3, Lines 50-55).**

Regarding Claim 8, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the injection of feed B in the riser occurs downstream of the injection location of feed A, in the section comprised of from 25% and 50% of the riser reactive section **(Gross et al. – Figure I).**

Regarding Claim 9, Gross et al. and Zhang et al. references disclose a process according to claim 1, wherein the injection location of feed B of lower crackability is defined aiming at obtaining the maximum possible LPG production, and depends on the properties of the processed feeds of different crackability, on the percentage of the feed of lower crackability processed based on the overall feed flow rate and on the riser outlet reaction temperature **(Gross et al. - Column 4, Line 65-Column 5, Line 12 and Column 9, Lines 9-21).**

Regarding Claim 10, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the best location injection for feed B of lower crackability is that, which provides the ideal operation conditions for maximizing LPG yield in the riser section comprised between the two feed injections, while allowing the minimum residence time required for feed B of lower crackability to undergo the desired conversion into lighter products, including LPG **(Gross et al. – Figures I, II and II and Column 7, Line 60-Column 8, Line 20).**

Regarding Claim 11, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the overall catalyst circulation rate is kept nearly constant during the cracking of feeds A and B **(Gross et al. – Table 2 - constant feed rate).**

Regarding Claim 12, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the temperature rise in the riser section between the base of the reactive section and the downstream riser injection location causes in

said section a huge feed conversion, so as to favor the yield in the sum of LPG and gasoline, by weight **(Gross et al. – Column 4, Lines 43 – 64).**

Regarding Claim 13, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein in the section between the downstream injection location and the riser top, feed B undergoes catalytic cracking reactions without significantly increasing the coke content deposited on the catalyst **(Gross et al. – Column 2, Lines 59-68).**

Regarding Claim 14, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the place of the one or more downstream locations should be selected so that the lower contact time is compensated by the optimization of the dispersion condition of feed B **(Gross et al. - Column 2, Lines 10-20 and Lines 62-68).**

Regarding Claims 15, Gross et al. reference discloses the process except for the absence of added hydrogen and the same feed B being injected in more than one riser location. Zhang et al. reference discloses the elements **(Zhang et al. – Column 1, Lines 8-9 and numeral 13 and 14).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to not use hydrogen in the process for catalytic cracking of hydrocarbon oils and have the two feed B entering the riser at the downstream as taught by Zhang et al., since Zhang et al. reference states at Column 1, Lines 7-12 that such modification would increase simultaneously the yields of diesel oil and liquefied gas.

Regarding Claim 16, Gross et al. reference discloses the process except for the absence of added hydrogen and different feeds B and C being injected in more than one riser location **(Zhang et al. - Column 1, Lines 8-9 and Column 5, Lines 41-42 - different).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to not use hydrogen in the process for catalytic cracking of hydrocarbon oils and have two different feeds entering the riser as taught by Zhang et al., since Zhang et al. reference states at Column 1, Lines 7-12 that such modification would increase simultaneously the yields of diesel oil and liquefied gas.

Regarding Claim 17, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the temperature levels of the segregated portion of feed B are equal or higher than those of feed A injected in the base of the riser reactive section **(Gross et al. - Column 4, Lines 43 – 48 – introducing regenerated catalyst at an elevated temperature to reduce the residence contact time).**

Regarding Claim 18, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the injection of feeds A and B of different sources in the base of the riser reactive section and in the downstream riser location is carried out simultaneously **(Gross et al. – Abstract).**

Regarding Claim 19, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the residence time of feed A in the riser submitted to the catalytic cracking reactions, measured between the injections of feed A and feed B, is in the range of from 0.5 and 2 seconds **(Gross et al. - Column 3, Lines 50-55 - 0.5 seconds up to about 2, 3, or 4 seconds).**

Regarding Claim 20, Gross et al. and Zhang et al. references disclose the process according to claim 1 except for the temperature rise in the mixing region between feed A and the regenerated catalyst being of from 10°C to 50°C, provided by the injection of feed B in a riser location downstream of the injection location of feed A, and is in the range of from 520°C to 650°C. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the claimed temperature ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

Regarding Claim 21, Gross et al. and Zhang et al. references disclose the process according to claim 1 except for the maximum temperature of feed B being 430°C. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the claimed maximum temperature for feed B, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 22, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the riser outlet reaction temperature is in the range of from 520°C to 590 °C **(Gross et al. – Column 4, Lines 7-9 – 850°F – 1050°F).**

Regarding Claims 23, 24, 25, and 26, the control system for feeds A and/or B does not distinguish the invention limitations from the process of Gross et al. and Zhang et al.

Regarding Claim 27, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the flow of the reactive catalyst to oil mixture is upwards **(Gross et al. – Column 3, Lines 51-52).**

Regarding Claim 28, Gross et al. and Zhang et al. references disclose the process according to claim 1 except for the flow of the reactive catalyst to oil mixture being downwards. It would have been obvious to one having ordinary skill in the art at the time the invention was made to observe some downward flow of the reactive catalyst in the rise due to the gravity.

Regarding Claims 29 and 30, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein feeds A and B are uniformly injected in the riser cross section by means of a plurality of highly efficient feed-injectors **(Gross et al. – Column 5, Lines 22-28)**

Regarding Claims 31, 32 and 33, Gross et al. reference discloses the process except for the absence of hydrogen and the catalyst comprising a Y zeolite and/or a ZSM-5 zeolite. Zhang et al. reference discloses the elements **(Zhang et al. – Column 1, Lines 8-9 and Column 3, Lines 4-5).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to not use hydrogen in the process for catalytic cracking of hydrocarbon oils and use Y zeolite and/or a ZSM-5 zeolite as catalyst, since Zhang et al. reference states at Column 1, Lines 7-12 that such modification would increase simultaneously the yields of diesel oil and liquefied gas.

Regarding Claim 36, Gross et al. and Zhang et al. references disclose the process according to claim 1, wherein the improved LPG yield results from the following conditions being obeyed:

i) the lower the crackability of feed B, the higher the time required for same to attain acceptable conversion levels **(Gross et al. - Column 1, Lines 12-16);**

ii) the higher the percentage of feed B based on the total processed feed, the higher the severity imposed to the cracking of feed A **(Gross et al. - Column 5, Lines 1-6);**

iii) the farther the injection location of feed B relative to the injection of feed A, the higher the time during which feed A will be submitted to the more severe cracking conditions that favor LPG yield (**Gross et al. – Figure 1 – height of injection vs. GASO);**

iv) the higher the outlet riser reaction temperature, the higher will be the temperature at which feed A will be submitted to catalytic cracking **(Gross et al. - Column 2, Lines 57-59).**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huy-Tram Nguyen whose telephone number is 571-270-3167. The examiner can normally be reached on MON- THURS: 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HTN
12/12/07

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